

SWARD Antenna Debugging Report

Customer Name: bmorn

Project Name: N15EPX-R (15.6-inch
plastic shell - Yidao motherboard-6252C
module)

Date: 2025. 10. 20

Project Contact Information

Customer contact person:
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Email:

SWORD structure:

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SWORD RF: Xiao Chunyan

mobile phone:

Phone: 0755-29985185

Email: swdrd005@szsward.com

Project Introduction

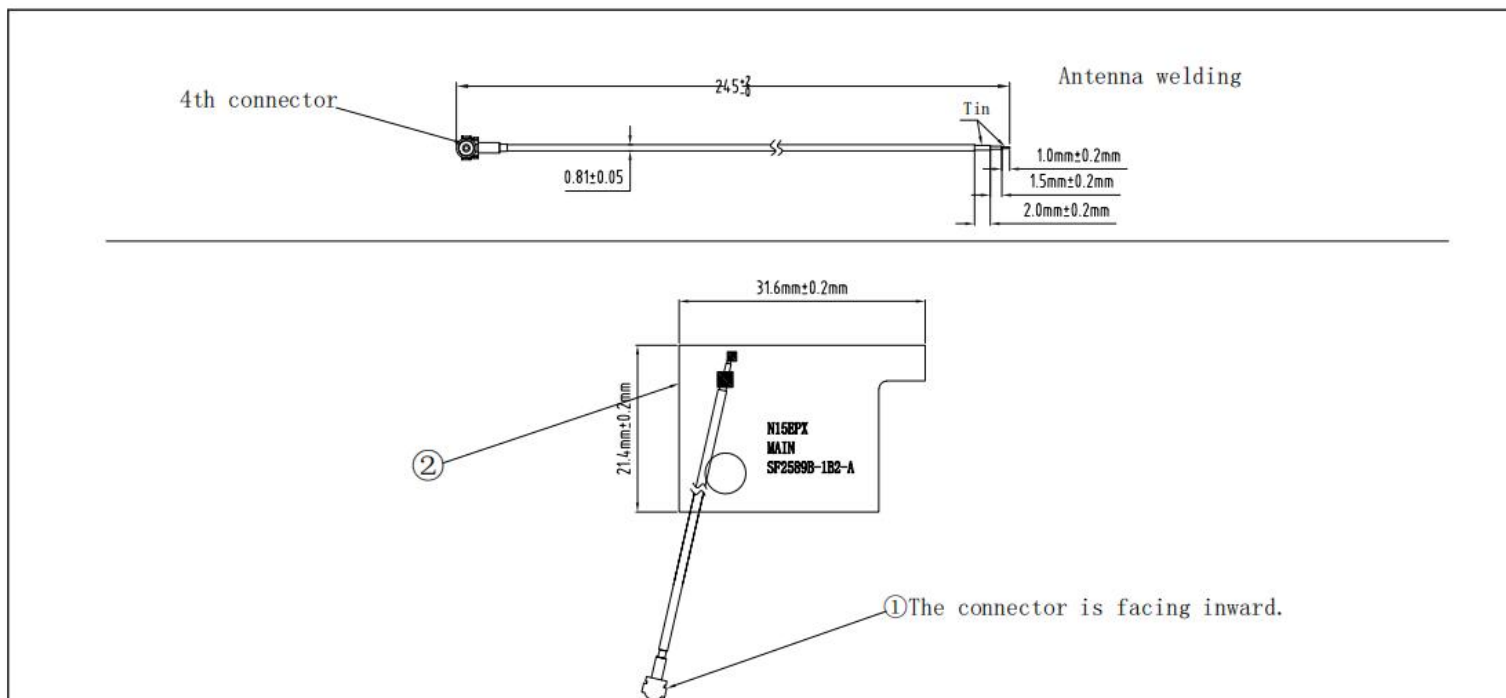
1. Project Brief

Number of project antennas	Machine type
2	WIFI notebook
Material of the whole machine shell: 15.6-inch plastic shell	

2.

Antenna number	name	operating frequency band/MHZ	Material/Struct ure
1	WIFI&BT&5Gwifi	2400MHz ~ 2500MHz & 5.8GHz	FPC
2	WIFI&BT&5Gwifi	2400MHz ~ 2500MHz & 5.8GHz	FPC

manufacturer: Shenzhen Suowode Communication Technology Co., Ltd
address: 601, 6th Floor, Building B, Hexi Hangcheng Industrial
Zone, No. 135 Qianjin 2nd Road, Bao'an District, Shenzhen



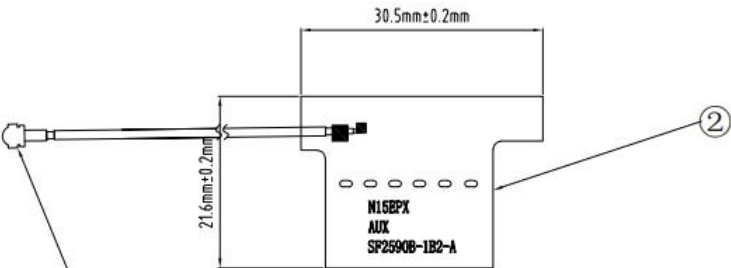
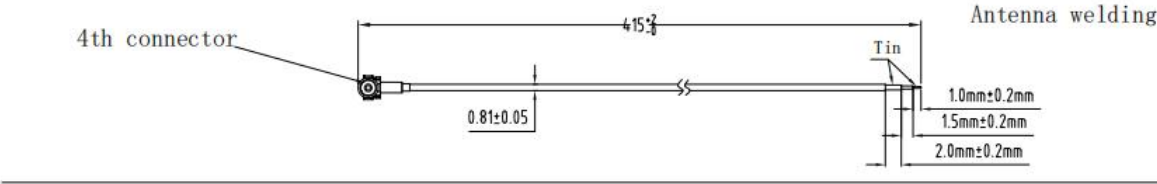
Technical Requirements:

1. Mark * for critical dimensions;
2. Dimensions must comply with the drawing requirements;
3. No incomplete or false soldering at the joints. The joints should be smooth and full.
4. The network test is passed (with the specified waveform).
5. The dimensional tolerances not specified are at level 6 of SJ/T 10628 1996, and the tolerance values are calculated by averaging the upper and lower deviations.

Packaging requirements:

1. PE sealed bag packaging
2. 100 pieces per bag.

5											SWORD	Communication Technology Co., Ltd.			
4												SF2589B-1L24B-245-A			
3						Signature	Date		Signature	Date			Stage marker	Organization	Ratio
2	FPC		Black	1	SF2589B-1B2-A		RD	WYT		2026.5.12					
1	coaxial cable	4th connector	Black	1	φ=0.81mm	RF							A	mm	N/A
Serial	NAME	Materials	Colour	Count	Description	Process			Approval			Total: 1Number pages:1 Page			ROHS



①The connector is facing inward.

- Technical Requirements:
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 - 4. The network test is passed (with the specified waveform).
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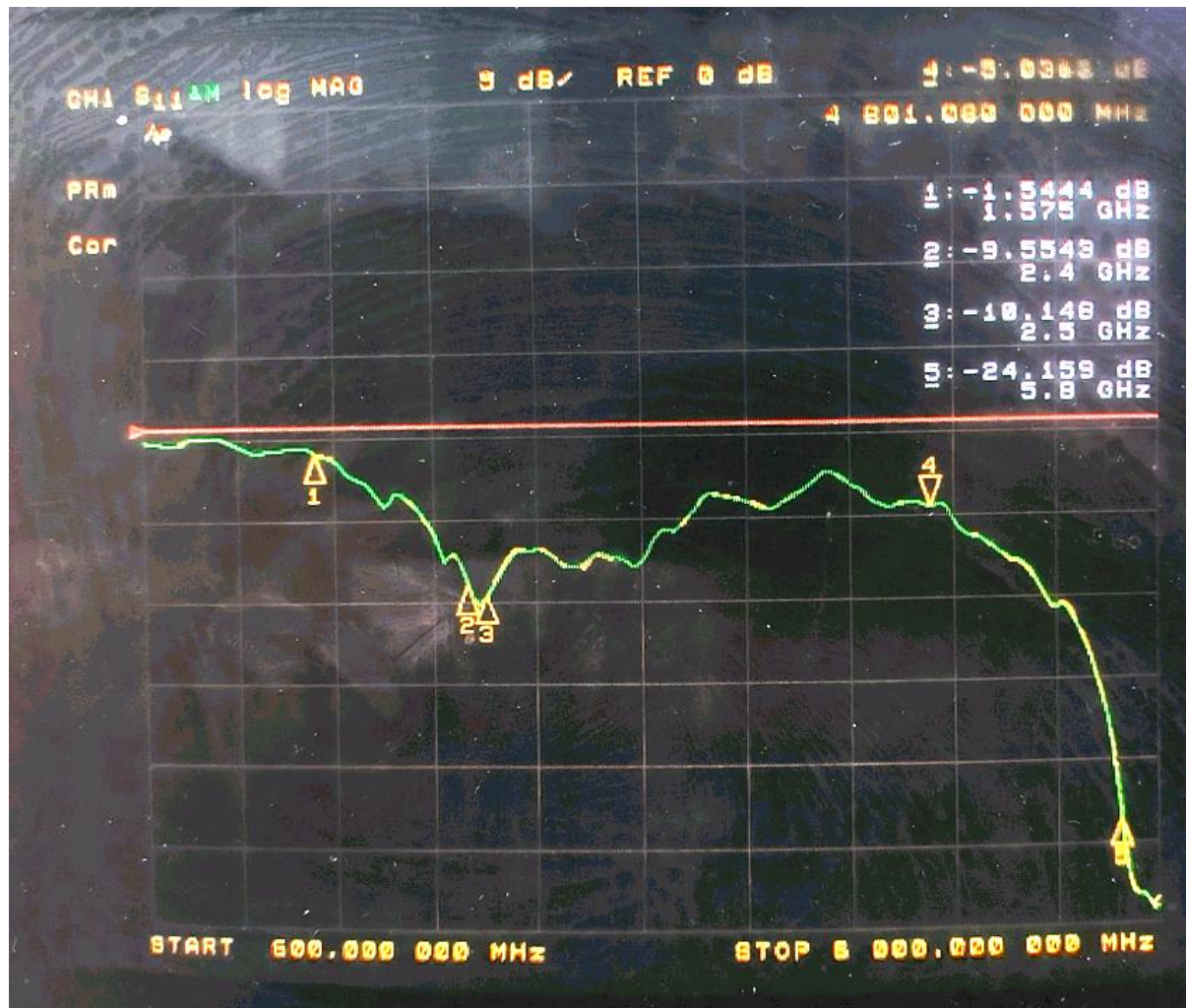
- Packaging requirements:
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5													
4													
3						Signature	Date		Signature	Date			
2	FPC		Black	1	SF2590B-1B2-A	RD	WYT	2026. 5. 12	QC				
1	coaxial cable	4th connector	Grey	1	φ=0.81mm	RF							
Serial	NAME	Materials	Colour	Count	Description	Process			Approval				

SWARD		
Stage marker	Organisation	Ratio
	A	N/A
Total: 1Number pages:1 Page		

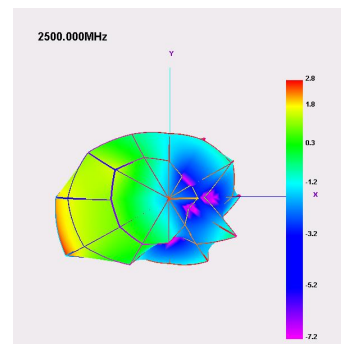
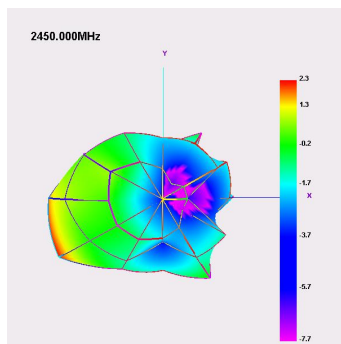
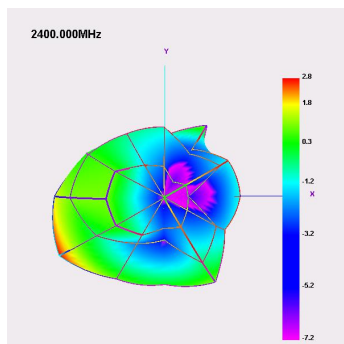
ShenZhen SWARD Communication Technology Co.Ltd
SF2590B-1L24G-415-A
ROHS

WIFI Main antenna S11



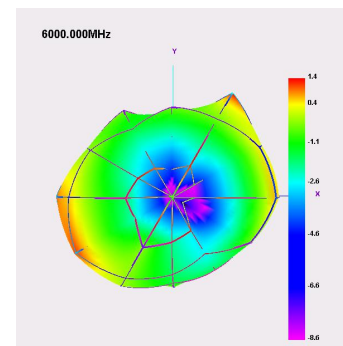
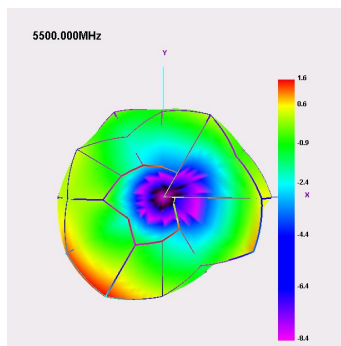
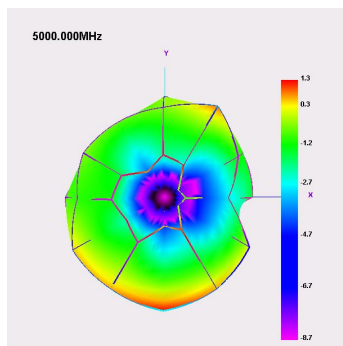
WIFI&BT antenna efficiency - main antenna

Passive Test For 2.4Gwifi						
Freq	Effi	Effi	Gain	Gain	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(dB)	(dB)
2400	46.63	-3.31	2.77	0.62	2.77	-13.28
2410	46.61	-3.31	2.66	0.51	2.66	-12.81
2420	51.09	-2.92	2.94	0.79	2.94	-12.08
2430	51.18	-2.91	2.86	0.71	2.86	-11.73
2440	51.58	-2.88	2.85	0.7	2.85	-11.77
2450	45.96	-3.38	2.35	0.2	2.35	-12.6
2460	45.91	-3.38	2.32	0.17	2.32	-12.55
2470	43.28	-3.64	2.11	-0.04	2.11	-12.77
2480	45.71	-3.4	2.42	0.27	2.42	-12.42
2490	46.95	-3.28	2.59	0.44	2.59	-12.52
2500	48.7	-3.12	2.82	0.67	2.82	-13.14



5G WIFI antenna efficiency – main antenna

Passive Test For 5Gwifi						
Freq	Effi	Effi	Gain	Gain	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(dB)	(dB)
5000	44.56	-3.51	1.31	-0.84	1.31	-18
5100	46.53	-3.32	1.56	-0.59	1.56	-16.31
5200	40.38	-3.94	1.01	-1.14	1.01	-16.81
5300	55.09	-2.59	1.75	-0.4	1.75	-16.41
5400	47.86	-3.2	1.64	-0.51	1.64	-20.47
5500	44.9	-3.48	1.6	-0.55	1.6	-21.4
5600	43.22	-3.64	1.12	-1.03	1.12	-23.86
5700	37.31	-4.28	0.19	-1.96	0.19	-20.94
5800	37.28	-4.28	0.6	-1.55	0.6	-20.27
5900	41.47	-3.82	1.05	-1.1	1.05	-16.16
6000	46.25	-3.35	1.4	-0.75	1.4	-20.14

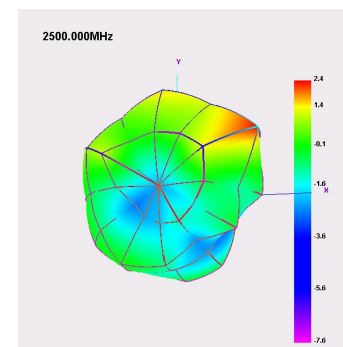
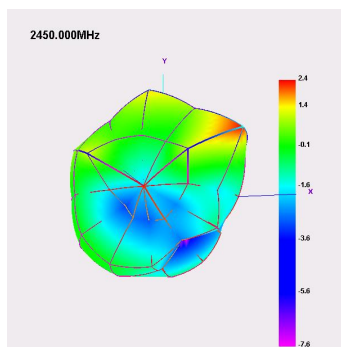
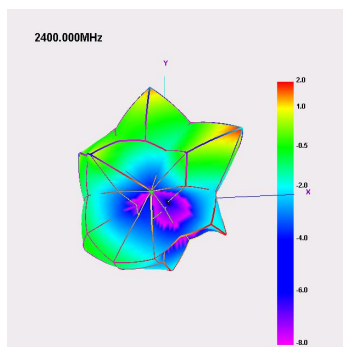


WIFI Secondary antenna S11



WIFI&BT antenna efficiency - secondary antenna

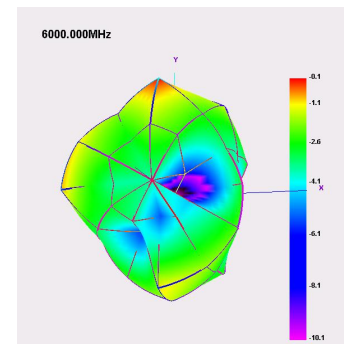
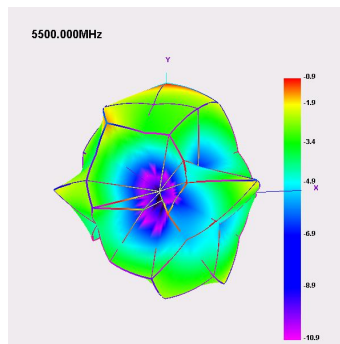
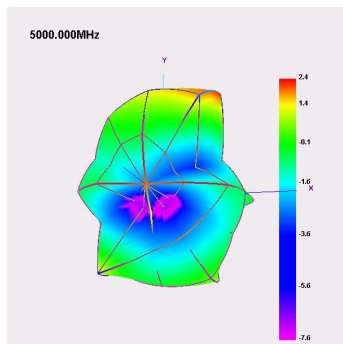
Passive Test For 2.4Gwifi						
Freq	Effi	Effi	Gain	Gain	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(dB)	(dB)
2400	40.72	-3.9	2.05	-0.1	2.05	-14.76
2410	39.2	-4.07	1.9	-0.25	1.9	-16.02
2420	43.74	-3.59	2.35	0.2	2.35	-16.8
2430	46.95	-3.28	2.76	0.61	2.76	-17.18
2440	49.4	-3.06	3.06	0.91	3.06	-17.39
2450	41.21	-3.85	2.43	0.28	2.43	-18.63
2460	39.81	-4	2.41	0.26	2.41	-19.08
2470	34.85	-4.58	1.96	-0.19	1.96	-20.39
2480	37.02	-4.32	2.21	0.06	2.21	-20.81
2490	38.43	-4.15	2.28	0.13	2.28	-20.94
2500	40.85	-3.89	2.42	0.27	2.42	-20.22



5G WIFI antenna efficiency

Passive Test For 5Gwifi

Freq	Effi	Effi	Gain	Gain	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(dB)	(dB)
5000	39.13	-4.07	2.37	0.22	2.37	-16.6
5100	38.42	-4.15	0.85	-1.3	0.85	-16.7
5200	31.22	-5.06	0.32	-1.83	0.32	-18.76
5300	38.39	-4.16	0.36	-1.79	0.36	-17.6
5400	33.48	-4.75	-0.13	-2.28	-0.13	-17.7
5500	28.53	-5.45	-0.92	-3.07	-0.92	-17.06
5600	29.7	-5.27	-1.27	-3.42	-1.27	-20.76
5700	26.96	-5.69	-1.34	-3.49	-1.34	-24.66
5800	27.28	-5.64	-0.68	-2.83	-0.68	-22.24
5900	22.15	-6.55	-0.67	-2.82	-0.67	-22.62
6000	22.13	-6.55	-0.08	-2.23	-0.08	-27.35



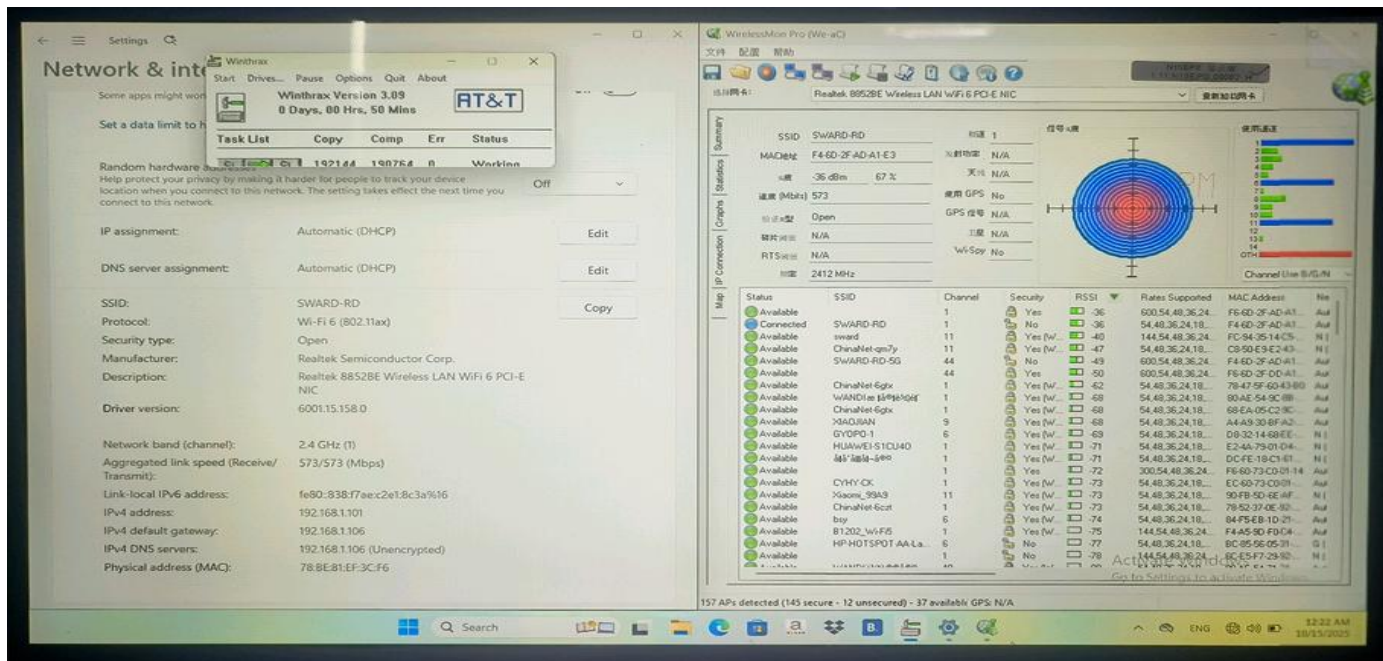
BT antenna measured distance

Actual test effect	
Model number	1
test environment	SWARD R&D Center
test equipment	Huawei AM08
test distance	> 10 meters

WiFi throughput

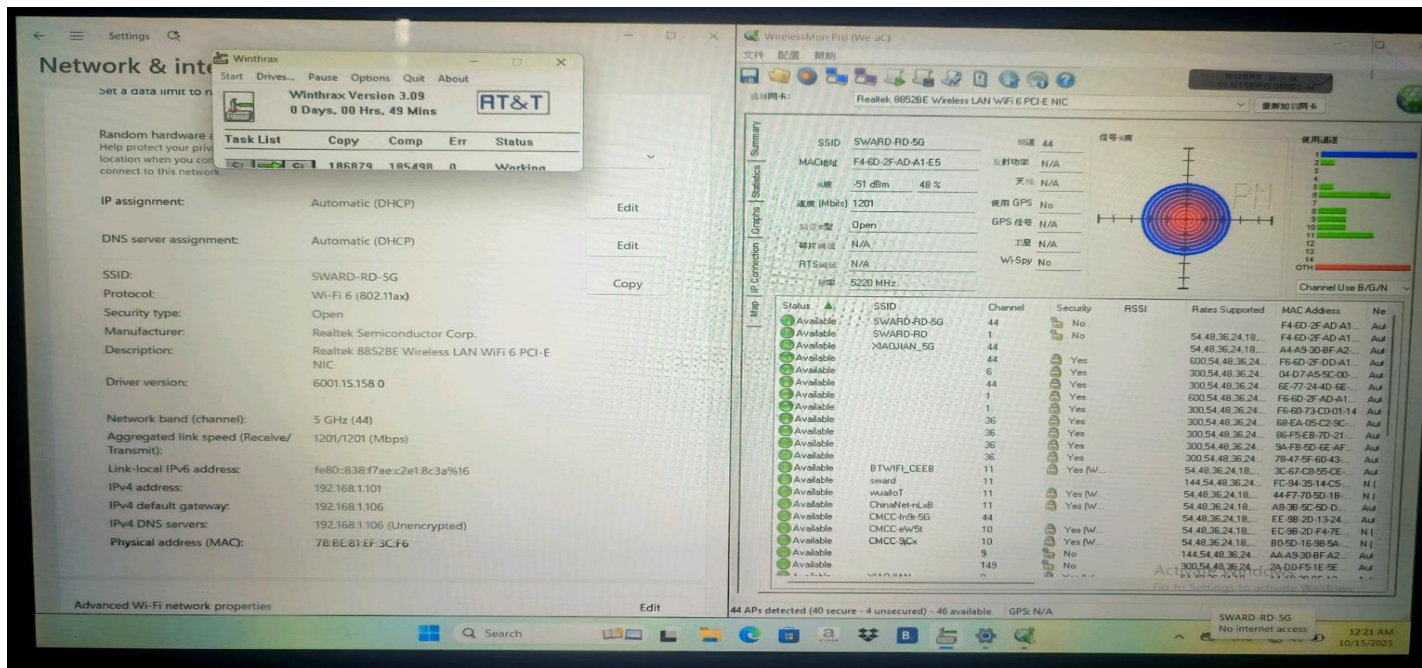
Iperf throughput test						
model	N15EPX-R (Yidao motherboard)	module	6252C module	software version	Windows_Iperf	
Model number	frequency band	distance	test angle	Test data (TX) 1-minute mean	Test data (RX) 1-minute mean	Remarks (number of packet drops)
1	2. 4G	2. 4G WIFI (Research and development testing 15m)	0°	87. 3 Mbps	156 Mbps	0
			90°	92. 9 Mbps	162 Mbps	0
			180°	90. 8 Mbps	157 Mbps	0
			270°	105 Mbps	189 Mbps	0
	5G	-				
		5F WIFI (Research and development testing 15m)	0°	427 Mbps	613 Mbps	0
			90°	433 Mbps	533 Mbps	0
			180°	454 Mbps	625 Mbps	0
			270°	421 Mbps	625 Mbps	0

WIFI天线信号强度实测图片（数据）



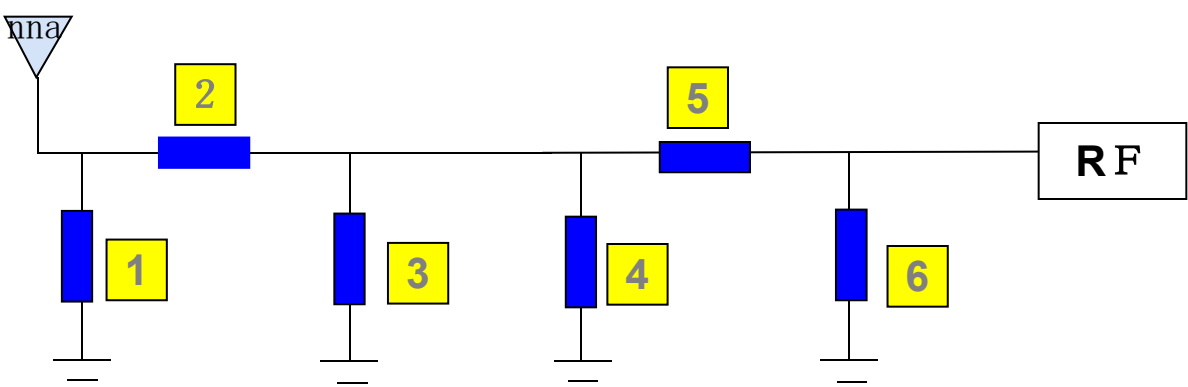
test location	Our R&D office					
Test group	2.4G/5G-Distance of 15 meters		2.4G/5G-Distance of 10 meters		2.4G/5G-Distance of 5 meters	
test frequency	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi
signal strength	-36 dBm	-51dBm	-29 dBm	-44 dBm	-21dBm	-34 dBm

WIFI antenna signal strength measurement picture (data)



test location	Our R&D office					
Test group	2.4G/5G-Distance of 15 meters		2.4G/5G-Distance of 10 meters		2.4G/5G-Distance of 5 meters	
test frequency	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi
signal strength	-36 dBm	-51dBm	-29 dBm	-44 dBm	-21dBm	-34 dBm

Antenna matching



No antenna matching has been changed.

main antenna	1	2	3	4	5	6	remark
Original Match							
Change Matching							

Debugging log

1. August 12, 2025, received machine debugging;
2. On August 14, 2025, after completing the debugging, arrange for sample submission and equipment return, and organize the report for submission;
3. On October 15, 2025, the customer provided trial production machines to our company for retesting. Upon completion, the machines were returned, and the test reports were compiled and sent;

Note: 1. This report is based on the actual debugging and testing of the prototype, including environmental handling, antenna positioning, and the assembly locations of various components

Do not alter arbitrarily;

2. If there are any changes in the materials used for the prototype, they must be promptly reported to our company for re-verification;

3. List of sensitive devices:

TP (material, coating, wiring, etc.)

Screen (amplification circuit, LED, cable harness design, etc.)

Shell material (antenna assembly method, structural interference, shell material type, antenna position height and area, etc.)

Motherboard (motherboard conduction, RF circuit matching, PA, duplexer, filtering, LNA, power supply circuit, etc.)

Camera, battery, motor, microphone, fingerprint recognition module, etc

4. Due to the limited quantity of prototype units or the presence of only one unit, some probabilistic issues cannot be fully identified. It is recommended to conduct small-scale trial production before mass production to address potential problems (e.g., screen flickering, audio distortion, touch panel malfunction, black screen crashes, signal degradation, etc.)